Careers in Medical Physics
Dear Student

Welcome to the captivating field of Medical Physics

If you are interested in a career within the medical and health disciplines, consider Medical Physics as a study option. Medical Physics is a very diverse field that utilizes the knowledge gained in other areas of physics and applies this knowledge to heal people. It is a vital component of many aspects of healthcare, including radiotherapy & medical imaging for cancer patients, cardiovascular, orthopedics and other specialties as well as medical research in general.

As a result of recent rapid translation of new physical techniques into medical instrumentation, physicists are becoming essential in many clinical areas, e.g. radiotherapy, radiology, magnetic resonance imaging (MRI), ultrasound imaging, positron emission tomography, pulmonary physiology, cardiology, ophthalmology or biomedical sensors and implants.

Employment as a Medical Physicist is often in hospitals, research centres or universities, with opportunities for on the job training, technical development, involvement in clinical healthcare as well as in further research and development. There is a great variety of work within this field both clinically and technically, whilst interacting with multidisciplinary teams of medical specialists.

Medical Physics is an exciting and rewarding career. I invite you to read this brochure with interest to learn more about the fascinating opportunities in this field. Further information can also be found on the ACPSEM website (www.acpsem.org.au).

Best Wishes,

Dr Stefan Eberl
President
Australasian College of Physical Scientists and Engineers in Medicine
What is Medical Physics?

Medical Physics is a branch of applied physics which employs physical concepts for the prevention, diagnosis and treatment of human disease.

It is not a new discipline; it is only in recent times emerging as a highly recognisable and valued area in medicine. Since the discovery of X-rays by Roentgen in 1895 and Becquerel’s discovery of radioactivity in 1898, medical physics has been a catalyst in the development of modern medicine.

Medical Physics has four main specialised areas which are Radiation Oncology, Nuclear Medicine, Radiology and Radiation Safety.

**Radiation Oncology**
Radiation Oncology Medical Physicists (ROMPs) work with physicians, nurses, therapists and engineers in the delivery of radiotherapy for the treatment of cancer. ROMPs are involved in clinical consultancy, treatment delivery and verification, quality assurance and latest technology evaluation.

**Nuclear Medicine**
Nuclear Medicine Physicists are responsible for the safe handling, calibration and use of radionuclides for the diagnosis and treatment of disease. They are also involved in Positron Emission Tomography (PET) and are consultants for other professionals seeking advice.

**Radiology**
Radiology Medical Physicists are the resident experts in the application of radiation for diagnosis. They direct and advise on the use of x-ray apparatus, computerised tomography (CT) and magnetic resonance imaging (MRI).

**Radiation Safety**
Whilst applicable and the responsibility of each specialty, Radiation Safety can be a separate role within itself. All other professionals rely on the medical physicist for radiation safety matters, advice and policy.
The Career Pathway....

The first step in the pathway is getting a good foundation Undergraduate degree majoring in Physical Sciences and featuring a strong math basis.

Bachelor of Science and Bachelor of Engineering are the most common but not the only undergraduate degrees.

I decided to do maths, physics and chemistry at high school, because they were subjects that I was good at and enjoyed.

Completing a broad Bachelor of Science degree allowed me to try all types of maths and science in the first year before having to select areas to specialise in and gave me more time to see what I really liked. After finishing my degree at Griffith University, I continued to do an Honours year in theoretical quantum physics.

I took up a position in the Patent Office (IP Australia) in Canberra immediately after finishing uni as a patent examiner in a physics and mechanical technology group.

After working in the public service I moved into the private sector working as a consultant in radiation safety for Australian Radiation Services Pty Ltd in Melbourne. This role as a health physicist involved work at a variety of locations from mining sites and oil rigs to hospitals and pharmaceutical companies. Through this work I realised I enjoyed working in medical physics, which combined applied physics, radiation safety and patient care.

I am currently working as a Medical Physicist and Radiation Safety Officer at the Alfred Hospital in Melbourne. I work primarily in the Radiology Department ensuring the radiation protection of staff, patients and visitors in the hospital. I am also undertaking a PhD at RMIT University investigating the radiation dose and risks to children in Australia from computed tomography scans.

I have found that the skills you gain by doing a physics degree, such as problem solving, are highly valued by employers. Medical physics has provided me with a career that is interesting, challenging and rewarding.

Zoe Brady  
Medical Physicist & Radiation Safety Officer  
The Alfred Hospital, VIC
After undergraduate study, becoming a Registrar in the Training Education and Assessment Program (TEAP) offered by ACPSEM is the next step. The TEAP includes completing a University postgraduate degree in Medical Physics along with clinical placement. It is also an option to enrol in TEAP after completing a relevant postgraduate degree.

... In a Nutshell

Joshua Moorrees
Medical Physics Registrar
Royal Adelaide Hospital, SA

From here there are a range of Career Opportunities including:

- Hospital Medical Physicist
- Private Clinic Medical Physicist
- Consultant
- Radiation Safety Advisor
- Medical Researcher
- University Lecturer

From an early age I was interested in knowing how the world and everything in it works, this led me to study physics.

I quickly realised though that there are not many jobs out there where you are able to work directly as a physicist using what you have learned. It was to my great surprise and pleasure that I discovered medical physics; a field where you are paid well, get to directly apply what you have learned in a clinical environment and most importantly make a difference in the diagnosis and treatment of cancer.

Physics is a very interesting area to work and study in. However, there are not a large range of jobs in physics that let you directly apply what you learn in a way that makes a difference, at least not without decades of experience. From the start medical physics offers a well paid career as a clinical scientist making a difference in the field of cancer care and diagnosis.

It is a field where there is always something new to learn and where most research into new radiotherapy treatments are conducted.

www.acpsem.org.au
Elizabeth Claridge Mackonis  
Deputy Chief Medical Physics  
Medica Oncology, NSW

How did you get to this position?
To specialise in medical physics I completed a Master of Medical Physics degree at the University of Sydney and took on a short term contract at St Vincent's Hospital. During my study, I applied for TEAP training positions and was employed into a training position at the Royal Prince Alfred Hospital. This training went for five years and involved a range of different topics from radiation safety to x-ray production and measurement.

What made you choose Medical Physics as a career?
I wasn’t sure what I wanted to do when I left university until I heard about medical physics. I knew I wanted to continue with physics in some way but I wanted a career where I could help people as well. I also was looking for a career where I could apply my skills, not just do research at a university.

Why would you recommend a career in Medical Physics?
I really enjoy being a medical physicist because my work is extremely varied due to the needs of patients and changing technology. I am constantly learning new things to keep up which stops the work being boring. It’s also a flexible career where you can do research or choose to focus on clinical work.

Neal Molloy
Senior Medical Physicist  
Adelaide Radiotherapy Centre, SA

How did you get to this position?
When finishing high school I didn't really know what I wanted to do. I had a bit of a talent for programming and IT was the boom industry at the time (around 2000) so I decided on a degree in Software Engineering. I really enjoyed Physics and Chemistry at school so chose to study Applied Science as well. Towards the end of my undergraduate degree, I started worked as a programmer for ~ 18 months and at the end of this time had come to the conclusion that the IT industry was not for me. I started to look around at what I could do with my Physics degree and attended a Post Graduate information evening at which I discovered medical physics. After the post grad evening, I enrolled in the Medical Physics M.Sc. course and after this joined the TEAP program in a radiotherapy clinic in Adelaide.

What made you choose medical physics as a career?
The first I heard of Medical Physics was at a post graduate information night at QUT in the last year of my undergraduate studies. The presentations at this night showed me a diverse field, which branches into Radiation Oncology (treatment of cancer), Medical Imaging (diagnosis of disease) and Health Physics (applications in the medical, nuclear and mining industries). The branch which caught my eye was in Radiation Oncology - could see a career where I could apply my knowledge of physical principles in a way which has a direct impact on the quality of treatment delivered to patients with cancer.

Why would you recommend a career in medical physics?
I would recommend a career in Medical Physics to anyone who enjoys the physical sciences & seeks a way to apply their knowledge to a field which has a clear impact on peoples' health and quality of life. Medical Physics is ideal for people who seek to specialise in a field, but who also enjoy variety in the work that they perform. A skilled MP is in high demand in research, clinical and teaching institutions, and can vary their commitment to these three spheres as their career/life progresses.
Farshid Salehzahi  
Principal Medical Physics Specialist  
Canberra Hospital, ACT

How did you get to this position?
I finished a Masters in Radiation Physics (Medical Track) at University of London in the UCL and QMW joint colleges in 1998 and became qualified as a UK Clinical Scientist registered with the Health Professions Council (HPC) in the UK.

After many years of clinical work, I became the Lead Clinical Scientist in Nuclear Medicine for The London Imaging Centre and was also a Consultant Clinical Scientist for the Saudi Government. I was the nuclear medicine physicist managing Quality Control and therapy services at Royal Hospital Haslar, UK Ministry of Defence naval base in Gosport.

In 2009, turning down a job at Cambridge University Hospital, I accepted a position with the Canberra Hospital (TCH) for an Australian adventure and lifestyle. I am currently collaborating with Geneva Hospital on a novel research topic in PET/MRI applications to clinical radiation treatment as a PhD concept.

What made you choose medical physics as a career?
As a child, I always wanted to become a scientist. When a close family member was diagnosed with a rare disease, my interest turned to clinical science and was eventually drawn to Medical Physics. I wanted to contribute to the society and improve patients’ lives and quality of service.

Why would you recommend a career in medical physics?
Medical Physics is a great profession for people with an interest and aptitude in Physics wishing to work in a ‘real-world’ job environment. Training programs are set in place now so that new graduates are employed in training positions where the majority of the first few years are spent with a focus on competency-based learning. Radiation Oncology departments can be rewarding team oriented workplaces. Physicists undertake important support, research, training and development roles within these departments. There are plenty of opportunities for research as well as local and overseas conferences and training courses.

Why consider Medical Physics for your future?
- Highly Rewarding and fulfilling career
- Highly Valued and sought after in public and private sectors
- Medical Physicists are in High Demand due to a national shortage. This shortage is expected to increase over the next 5-10 years

Farshid Salehzahi

Nigel Middlebrook

Radiation Oncology Medical Physics
Premion, Gold Coast QLD

How did you get to this position?
I graduated from QUT in 2004 with Bachelor degrees in Applied Science (Physics) and Information Technology. I then completed the Master of Applied Science (Medical Physics) in 2007 (part-time). My first ROMP position was at the Royal Brisbane and Women’s Hospital starting 2007, and I shifted to Premion in 2009.

What made you choose MP as a career?
My interest in Medical Physics began at university. There were only one or two subjects that contained Medical Physics components in the Physics undergraduate degree, and I was interested in the diverseness of the profession as well as the opportunity non-laboratory environment.

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